

What is claimed is:

1. A method of producing an intermediate image transfer belt for an image forming apparatus that includes an image carrier for forming a latent image, a developing device for developing said latent image with a developer to thereby form a corresponding toner image and said intermediate image transfer belt to which said toner image is transferred from said image carrier, and executes primary image transfer from said image carrier to said intermediate image transfer belt and then executes secondary image transfer from said intermediate image transfer belt to a recording medium, said method comprising the steps of:

feeding a first raw liquid material into a hollow, cylindrical mold, which is included in a centrifugal molding machine, while causing said mold to rotate;

curing the first raw material to thereby form a first endless belt layer on an inside of the mold;

feeding a second raw liquid material into the mold while causing said mold to rotate; and

curing said second raw liquid to thereby form a second belt layer;

wherein said first belt layer has elasticity while said second belt layer has greater hardness than said first belt layer.

2. The method as claimed in claim 1, further comprising the step of forming a third belt layer different in material from said first layer and said second layer on said second layer.

3. The method as claimed in claim 2, wherein the first raw liquid material provides said first belt layer with elasticity after curing while the second raw liquid material provides said second belt layer with hardness greater than hardness of said first belt layer after curing.

4. The method as claimed in claim 3, wherein said first belt layer and said second belt layer have a same major composition except for hardness.

5. The method as claimed in claim 4, wherein said first belt layer has hardness ranging from 30° to 70°, as measured by JIS A scale.

6. The method as claimed in claim 5, wherein said first belt layer has thickness ranging from 50 micrometers to 2,000 micrometers.

7. The method as claimed in claim 6, wherein the first raw liquid material comprises thermosetting polyurethane rubber.

8. The method as claimed in claim 7, wherein said second belt layer has hardness of 75° or above, as measured by JIS A scale.

9. The method as claimed in claim 8, wherein said second belt layer has a Young's module ranging from 200 MPa to 3,000 MPa.

10. The method as claimed in claim 9, wherein said second belt layer has thickness ranging from 30 micrometers to 1,000 micrometers.

11. The method as claimed in claim 10, wherein the second raw liquid material comprises thermosetting polyurethane resin.

12. The method as claimed in claim 11, wherein the inside of the mold has smoothness of 1 micrometer or less in terms of a ten-point mean roughness (JIS).

13. The method as claimed in claim 12, wherein the inside of the mold has a gloss value of 80 or above.

14. The method as claimed in claim 1, wherein the first raw liquid material provides said first belt layer with elasticity after curing while the second raw liquid material provides said second belt layer with hardness greater than hardness of said first belt layer after curing.

15. The method as claimed in claim 1, wherein said first belt layer and said second belt layer have a same major composition except for hardness.

16. The method as claimed in claim 1, wherein said first belt layer has hardness ranging from 30° to 70°, as

measured by JIS A scale.

17. The method as claimed in claim 1, wherein said first belt layer has thickness ranging from 50 micrometers to 2,000 micrometers.

18. The method as claimed in claim 1, wherein the first raw liquid material comprises thermosetting polyurethane rubber.

19. The method as claimed in claim 1, wherein said second belt layer has hardness of 75° or above, as measured by JIS A scale.

20. The method as claimed in claim 1, wherein said second belt layer has a Young's module ranging from 200 MPa to 3,000 MPa.

21. The method as claimed in claim 1, wherein said second belt layer has thickness ranging from 30 micrometers to 1,000 micrometers.

22. The method as claimed in claim 1, wherein the second raw liquid material comprises thermosetting polyurethane resin.

23. The method as claimed in claim 1, wherein the inside of the mold has smoothness of 1 micrometer or less in terms of a ten-point mean roughness (JIS).

24. The method as claimed in claim 1, wherein the inside of said mold has a gloss value of 80 or above.

25. A method of producing an intermediate image

transfer belt for an image forming apparatus that includes an image carrier for forming a latent image, a developing device for developing said latent image with a developer to thereby form a corresponding toner image and said intermediate image transfer belt to which said toner image is transferred from said image carrier, and executes primary image transfer from said image carrier to said intermediate image transfer belt and then executes secondary image transfer from said intermediate image transfer belt to a recording medium, said method comprising the steps of:

feeding a first raw liquid material into a hollow, cylindrical mold, which is included in a centrifugal molding machine, while causing said mold to rotate to thereby form an endless first film on an inside of said mold;

feeding a second raw liquid material into the inside of the mold while causing said mold to rotate to thereby form a second film on said first film; and

curing the raw liquid materials respectively forming said first film and said second film;

wherein said first film forms, when cured, an elastic, first belt layer while said second forms, when cured, a second belt layer having greater hardness than said first belt layer.

26. The method as claimed in claim 25, further comprising the step of forming a third belt layer different in material from said first layer and said second layer on said second layer.

27. The method as claimed in claim 26, wherein the first raw liquid material provides said first belt layer with elasticity after curing while the second raw liquid material provides said second belt layer with hardness greater than hardness of said first belt layer after curing.

28. The method as claimed in claim 27, wherein said first belt layer and said second belt layer have a same major composition except for hardness.

29. The method as claimed in claim 27, wherein said first belt layer has hardness ranging from 30° to 70°, as measured by JIS A scale.

30. The method as claimed in claim 29, wherein said first belt layer has thickness ranging from 50 micrometers to 2,000 micrometers.

31. The method as claimed in claim 30, wherein the first raw liquid material comprises thermosetting polyurethane rubber.

32. The method as claimed in claim 31, wherein said second belt layer has hardness of 75° or above, as measured by JIS A scale.

33. The method as claimed in claim 32, wherein said second belt layer has a Young's module ranging from 200 MPa to 3,000 MPa.

34. The method as claimed in claim 33, wherein said second belt layer has thickness ranging from 30 micrometers to 1,000 micrometers.

35. The method as claimed in claim 34, wherein the second raw liquid material comprises thermosetting polyurethane resin.

36. The method as claimed in claim 35, wherein the inside of the mold has smoothness of 1 micrometer or less in terms of a ten-point mean roughness (JIS).

37. The method as claimed in claim 36, wherein the inside of the mold has a gloss value of 80 or above.

38. The method as claimed in claim 25, wherein the first raw liquid material provides said first belt layer with elasticity after curing while the second raw liquid material provides said second belt layer with hardness greater than hardness of said first belt layer after curing.

39. The method as claimed in claim 25, wherein said first belt layer and said second belt layer have a same major composition except for hardness.

40. The method as claimed in claim 25, wherein said first belt layer has hardness ranging from 30° to 70°, as

measured by JIS A scale.

41. The method as claimed in claim 25 wherein said first belt layer has thickness ranging from 50 micrometers to 2,000 micrometers.

42. The method as claimed in claim 25, wherein the first raw liquid material comprises thermosetting polyurethane rubber.

43. The method as claimed in claim 25, wherein said second belt layer has hardness of 75° or above, as measured by JIS A scale.

44. The method as claimed in claim 25, wherein said second belt layer has a Young's module ranging from 200 MPa to 3,000 MPa.

45. The method as claimed in claim 25, wherein said second belt layer has thickness ranging from 30 micrometers to 1,000 micrometers.

46. The method as claimed in claim 25, wherein the second raw liquid material comprises thermosetting polyurethane resin.

47. The method as claimed in claim 25, wherein an inner surface of said mold has smoothness of 1 micrometer or less in terms of a ten-point mean roughness (JIS).

48. The method as claimed in claim 25, wherein the inner surface of said mold has a gloss value of 80 or above.

~~49. In an intermediate image transfer belt for an~~

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image forming apparatus that includes an image carrier for  
 forming a latent image, a developing device for developing  
 said latent image with a developer to thereby form a  
 corresponding toner image and said intermediate image  
 transfer belt to which said toner image is transferred from  
 said image carrier, and executes primary image transfer  
 from said image carrier to said intermediate image  
 transfer belt and then executes secondary image transfer  
 from said intermediate image transfer belt to a recording  
 medium,

a first raw liquid material is fed into a hollow,  
 cylindrical mold, which is included in a centrifugal  
 molding machine, with said mold being rotated;

the first raw material is cured to thereby form a  
 first endless belt layer on an inside of the mold;

a second raw liquid material is fed into the mold  
 with said mold being rotated, and then cured to thereby  
 form a second belt layer; and

said first belt layer has elasticity while said  
 second belt layer has greater hardness than said first belt  
 layer.

50. The belt as claimed in claim 49, wherein a third  
 belt layer different in material from said first layer and  
 said second layer is formed on said second layer.

51. The belt as claimed in claim 50, wherein the first

raw liquid material provides said first belt layer with elasticity after curing while the second raw liquid material provides said second belt layer with hardness greater than hardness of said first belt layer after curing.

52. The belt as claimed in claim 51, wherein said first belt layer and said second belt layer have a same major composition except for hardness.

53. The belt as claimed in claim 52, wherein said first belt layer has hardness ranging from 30° to 70°, as measured by JIS A scale.

54. The belt as claimed in claim 53, wherein said first belt layer has thickness ranging from 50 micrometers to 2,000 micrometers.

55. The belt as claimed in claim 54, wherein the first raw liquid material comprises thermosetting polyurethane rubber.

56. The belt as claimed in claim 55, wherein said second belt layer has hardness of 75° or above, as measured by JIS A scale.

57. The belt as claimed in claim 56, wherein said second belt layer has a Young's module ranging from 200 MPa to 3,000 MPa.

58. The belt as claimed in claim 57, wherein said second belt layer has thickness ranging from 30

~~micrometers to 1,000 micrometers.~~

59. The belt as claimed in claim 58, wherein the second raw liquid material comprises thermosetting polyurethane resin.

60. The belt as claimed in claim 59, wherein the inside of the mold has smoothness of 1 micrometer or less in terms of a ten-point mean roughness (JIS).

61. The belt as claimed in claim 60, wherein the inside of the mold has a gloss value of 80 or above.

62. The belt as claimed in claim 49, wherein the first raw liquid material provides said first belt layer with elasticity after curing while the second raw liquid material provides said second belt layer with hardness greater than hardness of said first belt layer after curing.

63. The belt as claimed in claim 49, wherein said first belt layer and said second belt layer have a same major composition except for hardness.

64. The belt as claimed in claim 49, wherein said first belt layer has hardness ranging from 30° to 70°, as measured by JIS A scale.

65. The belt as claimed in claim 49, wherein said first belt layer has thickness ranging from 50 micrometers to 2,000 micrometers.

66. The belt as claimed in claim 49, wherein the first

raw liquid material comprises thermosetting polyurethane rubber.

67. The belt as claimed in claim 49, wherein said second belt layer has hardness of 75° or above, as measured by JIS A scale.

68. The belt as claimed in claim 49, wherein said second belt layer has a Young's module ranging from 200 MPa to 3,000 MPa.

~~69. The belt as claimed in claim 49, wherein said second belt layer has thickness ranging from 30 micrometers to 1,000 micrometers.~~

70. The belt as claimed in claim 49, wherein the second raw liquid material comprises thermosetting polyurethane resin.

71. The belt as claimed in claim 49, wherein the inside of the mold has smoothness of 1 micrometer or less in terms of a ten-point mean roughness (JIS).

72. The belt as claimed in claim 49, wherein the inside of the mold has a gloss value of 80 or above.

~~73. In an intermediate image transfer belt for an image forming apparatus that includes an image carrier for forming a latent image, a developing device for developing said latent image with a developer to thereby form a corresponding toner image and said intermediate image transfer belt to which said toner image is transferred from~~

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material provides said second belt layer with hardness greater than hardness of said first belt layer after curing.

76. The belt as claimed in claim 75, wherein said first belt layer and said second belt layer have a same major composition except for hardness.

~~77. The belt as claimed in claim 76, wherein said first belt layer has hardness ranging from 30° to 70°, as measured by JIS A scale.~~

78. The belt as claimed in claim 77, wherein said first belt layer has thickness ranging from 50 micrometers to 2,000 micrometers.

79. The belt as claimed in claim 78, wherein the first raw liquid material comprises thermosetting polyurethane rubber.

80. The belt as claimed in claim 79, wherein said second belt layer has hardness of 75° or above, as measured by JIS A scale.

81. The belt as claimed in claim 80, wherein said second belt layer has a Young's module ranging from 200 MPa to 3,000 MPa.

~~82. The belt as claimed in claim 81, wherein said second belt layer has thickness ranging from 30 micrometers to 1,000 micrometers.~~

83. The belt as claimed in claim 82, wherein the

second raw liquid material comprises thermosetting polyurethane resin.

84. The belt as claimed in claim 83, wherein the inside of the mold has smoothness of 1 micrometer or less in terms of a ten-point mean roughness (JIS).

85. The belt as claimed in claim 84, wherein the inside of the mold has a gloss value of 80 or above.

86. The belt as claimed in claim 73, wherein the first raw liquid material provides said first belt layer with elasticity after curing while the second raw liquid material provides said second belt layer with hardness greater than hardness of said first belt layer after curing.

87. The belt as claimed in claim 73, wherein said first belt layer and said second belt layer have a same major composition except for hardness.

88. The belt as claimed in claim 73, wherein said first belt layer has hardness ranging from 30° to 70°, as measured by JIS A scale.

89. The belt as claimed in claim 73, wherein said first belt layer has thickness ranging from 50 micrometers to 2,000 micrometers.

90. The belt as claimed in claim 73, wherein the first raw liquid material comprises thermosetting polyurethane rubber.

91. The belt as claimed in claim 73, wherein said second belt layer has hardness of 75° or above, as measured by JIS A scale.

92. The belt as claimed in claim 73, wherein said second belt layer has a Young's module ranging from 200 MPa to 3,000 MPa.

~~93. The belt as claimed in claim 73, wherein said second belt layer has thickness ranging from 30 micrometers to 1,000 micrometers.~~

94. The belt as claimed in claim 73, wherein the second raw liquid material comprises thermosetting polyurethane resin.

95. The belt as claimed in claim 73, wherein the inside of the mold has smoothness of 1 micrometer or less in terms of a ten-point mean roughness (JIS).

96. The belt as claimed in claim 73, wherein the inside of the mold has a gloss value of 80 or above.

97. An image forming apparatus comprising:

an image carrier for forming a latent image;

a developing device for developing the latent image with a developer to thereby form a corresponding toner image; and

an intermediate image transfer body to which the toner image is transferred from said image carrier, said intermediate image transfer body constituting an



intermediate image transfer belt for executing primary image transfer from said image carrier to said intermediate image transfer belt and then executing secondary image transfer from said intermediate image transfer belt to a recording medium;

wherein a first raw liquid material is fed into a hollow, cylindrical mold, which is included in a centrifugal molding machine, with said mold being rotated;

the first raw material is cured to thereby form a first endless belt layer on an inside of the mold;

a second raw liquid material is fed into the mold with said mold being rotated, and then cured to thereby form a second belt layer; and

said first belt layer has elasticity while said second belt layer has greater hardness than said first belt layer.

98. An image forming apparatus comprising:

an image carrier for forming a latent image;

a developing device for developing the latent image with a developer to thereby form a corresponding toner image; and

an intermediate image transfer body to which the toner image is transferred from said image carrier, said intermediate image transfer body constituting an intermediate image transfer belt for executing primary

image transfer from said image carrier to said intermediate image transfer belt and then executing secondary image transfer from said intermediate image transfer belt to a recording medium;

wherein a first raw liquid material is fed into a hollow, cylindrical mold, which is included in a centrifugal molding machine, with said mold being rotated to thereby form an endless first film on an inside of said mold;

a second raw liquid material is fed into the mold with said mold being rotated to thereby form a second film on said first film;

the raw liquid materials respectively forming said first film and said second film are then cured; and

said first film forms, when cured, an elastic, first belt layer while said second forms, when cured, a second belt layer having greater hardness than said first belt layer.